Alliance for Physics Excellence - Addressing Alabama's HS Physics Teacher Needs

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Outline

• Alabama HS physics teacher needs
• Overview of APEX program
• Baseline data on participants (teachers and their students)
• Concluding remarks
Alabama HS Physics

• Shortage of physics offerings
  - 27% of students attend school with no physics. (Alabama ranks 44 out of 50 states + DC.)

• Shortage of students taking physics.
  - 19% in Alabama vs 37% in US

• Shortage of trained physics teachers
  - 10% are certified with physics major vs 34% US
APEX Partners

• AAMU - lead institution. In-service & pre-service training
• UA – teacher impact research, in-service & pre-service training
• AAPT/PTRA – in-service training
• Alabama Science in Motion – In-service training
• Drake State – leadership development
In-service Training

• In-service training to 77 HS physics teachers + 11 ASIM specialists
  - 2 wks sum + 6 days during academic year for 3 yrs
  - PTRA trainers (Jim & Jane Nelson)

• Topics
  - Year 1: Mechanics
  - Year 2: Fluids, Thermo, E&M, Circuits
  - Year 3: E&M, Waves & Sound, Optics, Modern Physics
ASIM Partnership

- ASIM: Loans equipment and provides training for about 2/3 of public high schools and physics teachers
- 11 regions each with full-time specialist
- Participates in APEX training as leaders and learners and selects teachers for training
- APEX and PTRA trained ASIM specialists may lead APEX training for 3rd cohort of teachers
Education Research and Assessment

• Baseline data – teacher backgrounds, classroom environment (year 0)
• Action research – teach selected APEX topics and assess and report outcomes
• Assess impact of APEX training on classroom environment (years 2 and 3+)
• 2 days of classroom observations, interviews, surveys each of 3 years.
Preliminary Results

• Partial training for 47 teachers + 11 ASIM specialists

• Baseline data on 47 teachers and classes
  - Weak content knowledge and PCK
  - Mostly traditional lecture-based instruction

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Major and Certification

Undergrad Major
- Biology: 33%
- Education: 22%
- General Science: 14%
- Chemistry: 11%
- Physics: 8%
- Engineering: 2%
- Other: 10%

Certification
- General Science: 90%
- Math: 5%
- Physics: 5%
Concluding Remarks

• Baseline studies show critical need
• Initial APEX training very positive
• Strong, evolving partnership with ASIM
• Parallel need for both pre-service and in-service training
  - UA-PhysTEC, APEX scholarships
• See GI01 for APEX talk by Cady et al

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